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SOME THOUGHTS ABOUT THE RELIABILITY OF THE TRANSMISSION OF MUSIC THEORY

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Berosos, the third century BC Babylonian historian thought all human knowledge came from Adapa who was the first of seven mythological Mesopotamian sages. The story first appears at Assur in the second millennium BC, also at Tell el-Amarna and during the Kassite period, around the fourteenth century BC, and probably elsewhere. Seven antediluvian sages were sent by Ea, the god of music, to bring the arts to humankind.

Adapa, also known as Uan, the Oannes of Berosos, introduced certain rites at Eridu. The sages are described in Mesopotamian literature as 'pure *parādu*-fish', the bones of which being found and associated with the earliest shrines, and still kept by Near Eastern mosques and monasteries.

Adapa the fisherman was iconographically portrayed as a fish-man composite. The word *abgallu*, sage (ab = water, gal = great, lu = man, in Sumerian) probably survived into Nabatean as *apkallum*, used to describe a certain kind of priest.

There was a general Babylonian tradition, according to which the beginnings of agriculture and architecture, religion and legislation, writing and reading, mathematics and astronomy and other sciences had been lost in the remotest antiquity.

Our knowledge of Babylonian science and literature has been derived principally from Ashurbanipal's library in the seventh century. But according to their colophons, the texts were mainly copies of Babylonian originals, from Akkad, Babylon, Nippur and elsewhere. But many scientific and literary texts from Kuyunjik were not first time writings in the seventh century. They existed in some form or another at a considerably earlier period. This view rested principally on a critical examination of the texts.

Berosos possibly from Akkadian *Bēl-rē'ušunu*, was a Hellenistic Babylonian writer, a priest of Bel Marduk and astronomer who wrote in Koine Greek and also in Aramean. There are fragments which have survived at several removes from the original Babyloniaca in two later Greek epitomes subsequently used by Eusibius of Caesarea's Chronological Canons. The Greek manuscripts are lost but have been somehow recovered with the Latin translation of Jerome, and also in Armenian translations.

Berosos was not popular with the Greeks who preferred the Persica of Ctesias of Cnidus, in the fifth century BC, for his accounts of Mesopotamia. Pagan writers relied on Posidonius of Apamea who lived around 130 to 50. There are tertiary sources with Vitruvius Pollio contemporary of Caesar Augustus, from Pliny the Elder who died during the Vesuvius eruption of seventy nine, and from Seneca the Younger who died around sixty five.

Later, seven pagan writers probably transmitted Berosos via Poseidonius through additional intermediaries such as Aetius, in the first or second century, Cleomedes, in the second half of the second century, Pausanias who was alive around 150, Athenaeus, around 200, Censorinus, in the third century, and an anonymous Latin commentator on the Greek poem Phaenomena by Aratus of Soli who was around 315 to 240. There are also Jewish and Christian references from a different source, either Alexander Polyhistor, around 65 BC or Juba II of Mauretania, around 50 BC to 20 AD. Polyhistor's numerous works included a history of Assyria and Babylonia, while Juba wrote 'On the Assyrians', both using Berosos as their primary source. Josephus's records of Berosos include some of the only extant narrative material, but he is probably dependent on Alexander Polyhistor, even if he infers that he had direct access to Berosos's material. The fragments of the Babylonaica found in three Christian writers' works are probably dependent on Alexander or Juba, or both. They are Tatianus of Syria in the

second century AD, Theophilus Bishop of Antioch, around 180 AD, and Titus Flavius Clemens around 200 AD.

In 1498, Annius of Viterbo claimed he discovered lost works of Berosos. They were forgeries which nevertheless greatly influenced Renaissance thought about population and migration. However, if indeed they were forgeries, they nevertheless would have been copied from something as the forgery was in the act of copying and not necessarily in what had been copied. Annius gave a list of kings from Japhet onwards, filling a historical gap following the Biblical account of the Flood. He also introduced characters from classical sources into the biblical framework in his *Commentaria super opera diversorum auctorum de antiquitatibus*.

Much more has been and could be said about Berosos. However my point here is how can we consider him as historian, or indeed as serious reference, as we only have fragmentary scraps, none of which being autographs. To my knowledge Assyriology does not confirm any of his Babylonian history. He has ignored the Babylonian Chronical Series with the exception of his ascribed writings on Nabopolassar. In fact, he only would have written about what he liked and ignored matters for which he had little or no interest and sometimes adapted the evidence to suit his views. Surely he was no historian as he appears apologetic demonstrating sometimes obsolete Babylonian traditions. However, he had the merit of collating Babylonian accounts from texts independent from one another. The evidence is gone.

But what all of this has to do with the transmission of music theory? I contend that with missing links in the chain of textual evidence, the reliability of transmission cannot be objective. If the writings of Berosos, for instance, who had access to probably the largest source of knowledge in the world, at that time, Babylon, and if most of his writings came from cuneiform texts he saw and probably read and then translated into the Koine, and if in turn his writings influenced other scholars, some of them his contemporaries, forming an almost continuous transmission chain until the tenth century CE, or thereabouts, and with the past, a continuous chain of transmission of some twelve centuries, minimum, and of two millennia, and perhaps more, and if the authenticity of the transmission of his works is radically, and justifiably questioned, why, therefore, a Pythagorean/ Platonician tradition of music theory hatching in the sixth century BC which does not reappear, until the second century AD with extremely fragmented Oxyrhyncus scraps of papyrus, and then only reappearing, but this time as entries in the Suda of the ninth century AD, and finally emerging into Greek, after the crusades in monasteries of Christendom, despite of broken chains of transmission spanning by as much as eight centuries for Pythagoras, and nevertheless retaining all of their credibility, then Berosos' works should be much more convincing than those of Pythagoras and of his followers of the Platonic tradition. But then Berosos is not as glamorous as Pythagoras.

The antithesis is that there can be a reliable transmission, usually called tradition, without the need for tangible textual evidence.

Both at Nippur and in Elam, at about the same time, around 2,200 BC, mathematical texts with identical contents were written, as we know from Scheil, Hilprecht, Pinches, Meissner, Bezold etc. These Nippur mathematical tables were unearthed in the late 1880s. It is without doubt that copies of these would have been kept in the libraries of Babylon and that Berosos would have been aware of their presence. Hilprecht published four of them in 1906, four years before a scandal about them was exposed and published in the New York Times on the 27th of November 1910. But this is irrelevant. What is relevant is that both Elam and Nippur and most probably the whole of Mesopotamia must have been conversant with their content, or that at least the erudite were able to make sense of it, but the whole of the population must have benefited from them because they were the basis for a common metrological system which was used for all that was measured, and that included music.

Simplifying the contents of the texts, let us say that essentially they are lists of regular numbers and their multiples and dividers, etc., given in the sexagesimal system.

Regular numbers are numbers that evenly divide powers of 60. For example, 60 to the power of

two = 3,600 = 48 × 75, so both 48 and 75 are divisors of a power of 60. Thus, they are regular numbers. Equivalently, they are the numbers for which only prime divisors are 2, 3, and 5.

The numbers that evenly divide the powers of 60 arise in several areas of mathematics and have different names coming from these different areas of study. In number theory, these numbers are called 5-smooth, because they can be characterized as having only 2, 3, or 5 as prime factors. This is a specific case of the more general k-smooth numbers, which are a set of numbers which have no prime factor greater than k. In Babylonian mathematics, the divisors of powers of 60 are called regular numbers. In Babylonian music theory, regular numbers occur in the ratios of tones in five-limit just intonation. This list of numbers span from 1 to 81 and exclude, of course all numbers which are not regular. They are:

> 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 25, 27, 30, 32, 36, 40, 45, 48, 50, 54, 60, 64, 72, 75, 80, and 81.

To put it simply they are all multiples of the sides of the right angle triangle, except when the multiples are not regular numbers. This is what had been attributed to Pythagoras but was known 1,600 years before him. Therefore, by the time he was born, there would have been nothing left for him to discover.

Now regular numbers include the following integers: 60/ 50/ 40 which are the principal quantifications of the principal gods of the Pantheon, basis for the Babylonian musical system: 60 for Anu, 50 for Enlil, and 40 for Ea, with the ratios of 60/ 50 = the minor third; 50/ 40 = the major third, and 60/ 40 = the just fifth. These intervals are reflected in CBS 10996, although I contend that they were misinterpreted due to their arrangement within a heptatonic system which inversed intervals and therefore led to the perception that the Babylonian intervallic system included the major third/ minor sixth; minor third/ major sixth; just fifth/ just fourth. However, the intervals in CBS 10996 span, in their logical order, a triskaidecachord. That 13 is not a regular number would not have represented a problem as long as the pitches sitting on them were regular.

Most importantly the sexagesimal texts end with numbers 80 and 81. They are of fundamental importance in music theory. Their ratio 81/ 80 is known to musicologist as the syntonic comma, comma of Didymus, Ptolemaic comma, chromatic dieses or diatonic comma. It is a small interval to the frequency ratio 81/ 80, or around 21.51 cents, that is about one eighth of a tone. Two pitches which differ by this interval would sound differently from each other even to untrained ears, but would be close enough that they would be more likely interpreted as out-of-tune versions of the same note than as different notes. The comma is referred to as a 'comma of Didymus' because it is the amount by which Didymus is said to have corrected the Pythagorean major third to a just major third (81/ 64 or 407.82 cents - 21.51 = 386.31 cents or 5/ 4).

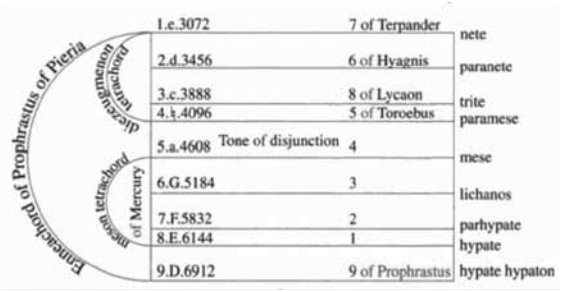
Mathematically, by Størmer's theorem, 81/ 80 is the closest superparticular ratio possible with regular numbers as numerator and denominator. A superparticular ratio is one of which the numerator is 1 greater than its denominator, such as 5/ 4, and a regular number is one the prime factors of which are limited to 2, 3, and 5. Thus, although smaller intervals can be described within 5-limit tunings, they cannot be described as superparticular ratios.

I shall not discuss these tables in depth since this is not my purpose here but I will quote Hilprecht writing that '...with regard to the first line of the division tables [ ] they all read 1 - 8,640,000 A-AN. The quotient 8,640,000 being 2/ 3rd of 12,960,000, we should rather expect '1 and 1/ 2' instead of '1' as its divisor, for 12,960,000 divided by 3/ 2 is 12,960,000 multiplied by 2/ 3. (See below) I am unable to explain this strange phenomenon. Possibly we have to regard it as an abbreviated expression well understood by the Babylonians.' It might also have been, as noted by Crickmore, a reference to the god Ea being also known as the god of two-thirds.

1	8,640,000	*A-AN*	
2	6,480,000		
3	4,320,000		
4	3,240,000		
5	2,592,000		
6	2,160,000		
8	1,620,000		
9	1,440,000		
10	1,296,000		
12	1,080,000		
15	864,000		
16	810,000		
18	720,000		
20	648,000		
24	540,000		
25	518,000		
27	480,000		
30	432,000		
32	405,000		
36	360,000		
40	324,000		
45	288,000		
48	270,000		
50	259,000		
54	240,000		
60	216,000		
64	202,500		
72	180,000		
[80	162,000]		
[81	160,000]		

And then, 1,600 years later, Plato emerges with his geometrical number of 12,960,000 in his Republic, Book VIII, 546, B to D which he calls 'the lord of better and worse births', and which according to him is the arithmetical expression of a great law controlling the universe. This would be a law of harmony, a fundamental law ruling the balance of the universe resulting in ratios of musical intervals of just expression. A few years ago, Leon Crickmore magisterially related Plato's 'two harmonies' in Plato's Republic, 545c to 546 d where the nine muses appear as factors of 60 to the power of four: 2400 for Clio; 2700 for Euterpe; 3000 for Thaleia; 3200 for Melpomene; 3600 for Terpsichore; 4050 for Erato; 4320 for Polyhymnia; 4800 for Urania and 5400 for Caliope. These equate respectively to the descending enneatonic Sumerian Babylonian pitch set, the *pitum*, or opening set: 'a, g, f, e, d, c, b, a, g' which Crickmore translates as 'the Dorian and Phrygian octave species in Pythagorean intonation, with tone numbers corresponding to the first nine terms in Plato's 'World Soul' in *Timaeus*, 34-7. The original terms have to be multiplied by 6 and then by 64 to ensure integers.'

It makes little doubt that Plato drew the maths from Babylon and then doctored the lot to make it stick to his story but in the mean time he had lost the meaning of sexagesimalism. It remains that between the period at which the mathematical texts were written and Plato's emergence, there is a textual lacuna of around 1,600 years. After Plato, we have to wait another millennium before Neo-Platonician Boethius (480-524/5) re-introduces enneatonism which he claims, this time, as the invention of Prophrastus of Pieria (Petriotes) (mid fifth century BC) in Nichomachus *Excerpta 4* (JanS. 274). However, Pliny attributes the invention of the enneachord to Timotheus of Miletus, around 446 to357 BC.



In the course of centuries, the tradition reinforced the myth and it is only centuries later at the dawn of the twentieth that the Mesopotamian source was at last unveiled. However, Plato remains more credible than the written evidence of an obscure scribe from Nippur, even if there is not a shred of evidence for any of Plato's writings until the twelfth century CE.

Thus after centuries of oblivion, the Nippur texts reached Boethius via Plato, and probably others, although they have vanished from the cuneiform corpus which by the first century AD was all but extinct until deciphered again some 1,800 years later in the late nineteenth century.

The antithesis is that somehow, there has been an accurate oral transmission of knowledge. It appears that there was some discrimination in the conservation of manuscripts. Some made their way to us and others simply vanished as by magic, and there appears political, and religious motivations. Far from promoting a conspiracy theory, which although fashionable, has no purpose here but I will put forward that the Crusades, from Urban's first in 1095, numerous manuscripts were brought back to monasteries of Christendom, most of them written in Syriac and in Arabic, some in Hebrew and were then re-filtered through their translation in Mediaeval Greek and later in Latin.

Now Mathiesen in his 'Corpus of Greek Music Theory', in the Cambridge Histories Online, 2008, writes that a significant body of Greek literature can be considered as music theory, although some works are known only as titles mentioned in passing or as brief quotations in the works of Athenaeus and others. Nevertheless, a substantial part of Greek theory survives, and extends from the fourth century BC to the fourth century AD, or even later.' Then he clarifies his position

affirming that: 'These later works, however, should be considered 'representatives of the transmission' of ancient Greek music theory rather than parts of its primary corpus.

Follows his list: Aristoxenus: 360 BC, and died after 320, *Harmonic Elements and Rhythmic Elements*; Anonymous. fourth to third century BC *Division of the Canon* (attributed to Euclid in some sources); Cleonides in the second century AD, *Introduction to Harmonics;* Nicomachus of Gerasa living around 100 to 50 AD, *Manual of Harmonics*; Theon of Smyrna living around 115 to 40 BC, *On Mathematics Useful for the Understanding of Plato*; Claudius Ptolemy living around 127 to 48 AD, *Harmonics*; Gaudentius third or fourth century AD, *Harmonic introduction*; Porphyrius 232 or 3 to around 305 AD, *On Ptolemy's Harmonics*; Aristides Quintilianus late third to mid fourth century AD, *On Music*; Bacchius Geron, in the fourth century AD or later, *Introduction to the Art of Music*; Alypius fourth to fifth century AD, *Introduction to Music*.

That this material has now been recognised, generally, as 'ancient music theory' is misconception. Firstly the so-called ancient texts have not been written before the first or second centuries BC. There are quotations of the works, and of some of their content in later surviving literature. How reliable are these? The earliest surviving scraps of papyrus were found at Oxyrhynchus and might, reveal some lines of Aristoxenus's *Harmonic and Rhythmic Elements*, and other works. Some parts of the *Division of the Canon* are perhaps almost contemporary, but all the other surviving treatises, reaching us, as much later copies of the eleventh century and later, date, it is claimed, initially from the end of the first century AD or later. To quote Mathiesen again: ' The extent to which these later copies preserve the form and content of any of the treatises is, in general, impossible to determine, nor can one be certain whether the titles or even the authors assigned to the treatises in the manuscripts represent the actual author and title of the treatise when it was first composed. It is also uncertain whether the earliest treatises on ancient Greek music theory were the work of an individual theoretician or whether they were later assembled by students, followers or others. In rare cases, it is possible to see the way in which a treatise develops even to the extent of changing its argumentation, as it is transmitted across the centuries.

Thus the whole of the corpus of Greek music theory, which term is wrong, in the light of the presumed contents, since 'theory' stems from 'theoria' which implies the visual and therefore should address to the description of a process and not to mathematical and geometrical handling of ratios.

Aristoxenus appears to be closest to Babylonian scholarship in that he defines intervals as sounded from two differing pitches by their tension and relaxation resulting in their consonance or dissonance, and not by the application of ratios. This is Old Babylonian theory as shown with UET VII, 74 (ca 1750 BC) where sets are constructed into a system resting on consonance: *zaku*, and dissonance, *la zaku*. For Aristoxenus, the fourth and the fifth, not the octave, were the pitch cells of music and music theory. Intervals must be combined in a certain way, and so they are in the Hurrian texts. The study of intervals was not about ratios, as it had been for the Pythagoreans and the Harmonicists, but was about understanding a coherent musical arrangement of intervals. Aristides Quintilianus describes among his six early harmoniai an enneatonic Dorian, comparable to the Babylonian enneatonic 'opening' pitch set *pitum*. By the end of the fourth century CE, ancient Greek music theory was just the ghost of an ancient civilization where traditions were confused and even lost. Writers such as Martianus Capella, Boethius, and Cassiodorus all relying on relatively late sources to preserve and transmit what remained, to the Latin readers of the Middle Ages. Thus, later Greek writers such as Nicomachus, Ptolemy, Gaudentius, and Aristides Quintilianus represented the final stages of Greek music theory in antiquity, filtered through their Latin interpreters, and are the first stages of ancient Greek music theory as it came to be known in the Middle Ages.

The Suda credits Aristoxenus with the authorship of 453 volumes. Nothing much has survived except an incomplete treatise on Rhythm, and the so-called '*Three Books of the Harmonic Elements*'. The oldest manuscript are:

a) *Codex Venetus* in St Mark's Library, written by Zosimus in Constantinople in the twelfth century. It has been corrected by many hands; but two of special importance have been identified, one older than the fourteenth century and one later.

b) *The Codex Vaticanus* was written in the thirteenth and fourteenth centuries, and appears to have been directly copied from the previous manuscript.

c) The *Codex Seldenianus* in the Bodleian Library, dates from the beginning of the sixteenth century. It depends closely on the *Codex Vaticanus* throughout, though its exact relationship is hard to determine. d) The *Codex Riccardianus* in Florence of the sixteenth century.

e) *The Codex Barberinus* in the Bibliotheca Barberina in Rome of the first half of the sixteenth century.

But the earliest codex preserving ancient Greek music theory is *Heidelbergensis Palatinus* gr. 281. It was probably written in Seleucia on the west bank of the Tigris River, Mesopotamia (present day Iraq) by the scribe, Nikolaos Kalligraphos, and completed on January 14, 1040. The manuscript is preserved at Heidelberg University Library.

"The scribe's colophon states that 'this book was assembled from many works among the private papers of Romanus, judge at Seleucia and my master. All you who read it, pray for him.' The codex was conceived as a complete book; there are no blank leaves or sides. It preserves [Michael] Psellus' complete *Syntagma* together with the preliminary *Logices*, and this is followed by his *Opiniones de anima*, a short excert from Leontinius on the *hypostatases*, chapter 38 from Photius *Quaestiones ad Amphilochium*, and ten short theological treatises by Theodore Abucara, an author represented in Arethas' collection of books. It is surely no coindicence that this codex preserves these particular works, which point back to libraries of the ninth century, as well as the work of Psellus. After Theodor Abucara, the codex includes the *koine hormasia* and an accompanying canon; three sections from Theon of Smyna's treatise, here titled Μουσικομ κανονοξ κατατομη, or '*Division of the Musical Canon*'; a short explanation of the musical ratios and *genera*, part of which corresponds to section 103 of the so-called Bellermann's Anonymous, and a series of excepts from Bacchius' treatise. . . " (Mathiesen, "*Hermes of Clio*? The Transmission of Ancient Greek Music Theory", Palisca, Baker, Hanning [eds.] Musical Humanism and its Legacy. Essays in Honor of Claude V. Palisca [1992] 9-10).

Conclusion:

The West, and especially Germany during the nineteenth century have looked at both Spartan and Athenian Greece as cultural paradigms.

However, Greece, from its antiquity, turned to the East and to the South for its inspiration but was never attracted to north western Europe preferring the shores of the Mediterranean, as well documented from archaeology, history and mythology. On the other hand Mesopotamia and Egypt would have been seminal to Greek inventiveness and also a source of conservation for their culture during the Orientalizing period. As soon as the Greeks came to Mesopotamia, and then later with Alexander's conquest of Babylon, Greek became the language of scholars. By the time of Jesus, all of the Babylonian knowledge was taught, written and practiced in Greek and progressively, even Babylonians, Assyrians and their descendants, who spoke various languages stemming from the original Babylonian, thought, *de facto*, that all knowledge, too, must be Greek. This is how, centuries later scholars such as Farabi, Kindi, Sina, Rushd, etc., wrote about a theory of music that they thought Greek but that in fact was essentially Babylonian with occasional Greek and other inflections. The crusades, just arriving at the turn of the century plundered Levantine libraries. By that time there was little Greek material left as all had been turned back into Semitic Syriac, Hebrew, Arabic and even Farsi. The remaining Greek material would have been rescued by Constantinople, if indeed it ever reached the city. However, even the Semitic treatises erroneously mentioned Greek sources having forgotten all of Babylon's cultural past as no one could read cuneiforms any longer. Thus even Farabi was certain that the music of the Arabs about which he was writing, was Greek, essentially. Indeed Farabi was even known as the Second Master, the first being Aristotle.

When crusaders brought back their 'grail' of books to their Christian monasteries, the monks hastily converted the Semitic material into Greek, and Latin, even Romanising scholars and so Farabi became Farabius, Sina became Avicena, Rushd became Averroes, Kindi, Kindius, etc. The God fearing Guido would have committed straight forward and unashamed plagiary with his rather peculiar and unskilful naming of notes. The Semitic originals would then have been destroyed, probably by fire, and was not even recycled as there is only microscopic evidence of palimpsests from Oriental originals.

Transmission can only be an unreliable process as it depends on the quality of the transmitter and on the quality of the perception of the receiver. The decaying nature of time has not necessarily conserved the best works. Ancient Greek material as observed (theorized) by a Latin, an Arabian, a Persian scribe, interpreter, translator, would have resulted in versions which would rarely have equated, faithfully, to the primary intention. Then, the receiver would have made his own interpretation of the interpretation of his transmitter. Had the transmission process be multiple, then the object of the transmission would also become multiple and would have led to a diversity of perceptions of the same original. The multiplicity of the transmission process would mainly have been the consequence of translation, direct or indirect if intermediary languages intervened. The unreliability of the transmission process would also be amplified at various periods during which transmission and translation was made in the light or obnubilated by political/ historical dictates.

Examples:

In the West there is insistence at naming Greek pitch sets as 'modes', a term unknown to Ancient Greece. The term is only used later for specific ecclesiastical sets and do not describe anything else than what they originally have been meant to describe. Whenever the term 'mode' is used, whether to describe Debussy or Fauré's music, to describe some forms of Jazz, or even to describe *maqam*, it is inappropriately used. Regardless most musicologists use the same term for Babylonian sets. The word 'mode' has no equation in any of the Semitic languages of Antiquity. Ancient Greek sets were tetrachordal where intervals were arranged in *genera*. We have no name for *genera* in Akkadian. Babylonians also used sets of five and three pitches, and later, and during the first millennium added sets of four of them. These sets are identical to *ajnas*, (thirds and fourths) and '*uqud* (fifths) of *maqam* expression which obviously came directly from the Babylonian system. And this seems quite logical as it would be absurd to hypothesize that they would have used a method only devised much later and only known to the West! The *ajnas* and '*Uquds* each have their names and so do have Babylonian equivalents. Each *maqam* set is filled and so are the Babylonian sets. Western scholars mostly reject this interpretation and see babylonian scales as heptatonic modes with empty intervals hence their assumption that harmonic dyads existed for the purpose of musical composition as with the Hurrian songs. Our Western education has fudged our ability to perceive with objectivity systems differing from ours, or rather to perceive that our systems are different from others, especially arising from Semitic antiquity. In the West, we have assumed so much for the past thousand years that we do not know any longer where exactly we stand and sample music in relation to the position of pitches incarcerated within the octave. Ratios were known in Ancient Babylonia. However, they were not used in music, as far as we know, and without ratios, the octave is meaningless. Babylonian theory rests on the tension and the relaxation of strings, therefore of pitches, much to the liking of Aristoxenus. It is a question of perception and not of ratios, to the disliking of Pythagoras. Our perception of Oriental music is flawed because of Western subjectivist blinkers. The big question is how much of Greek music is Babylonian and how much of Babylonian music is Greek?

Heidelbergensis Palatinus gr. 281. Written in Seleucia on the west bank of the Tigris River, by Nikolaos Kalligraphos, and completed on January 14, 1040.

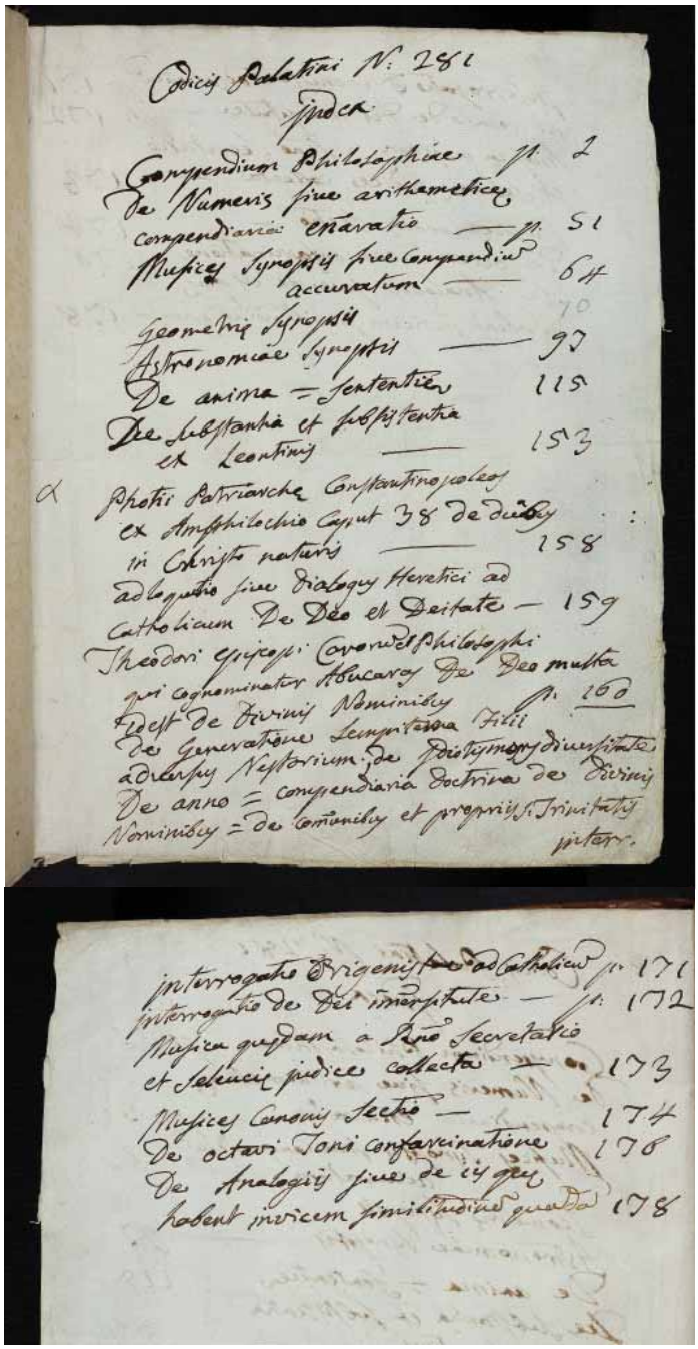


Figure 1. Codex Pal. Graec. 281. Page 4 Obv. and Rev.

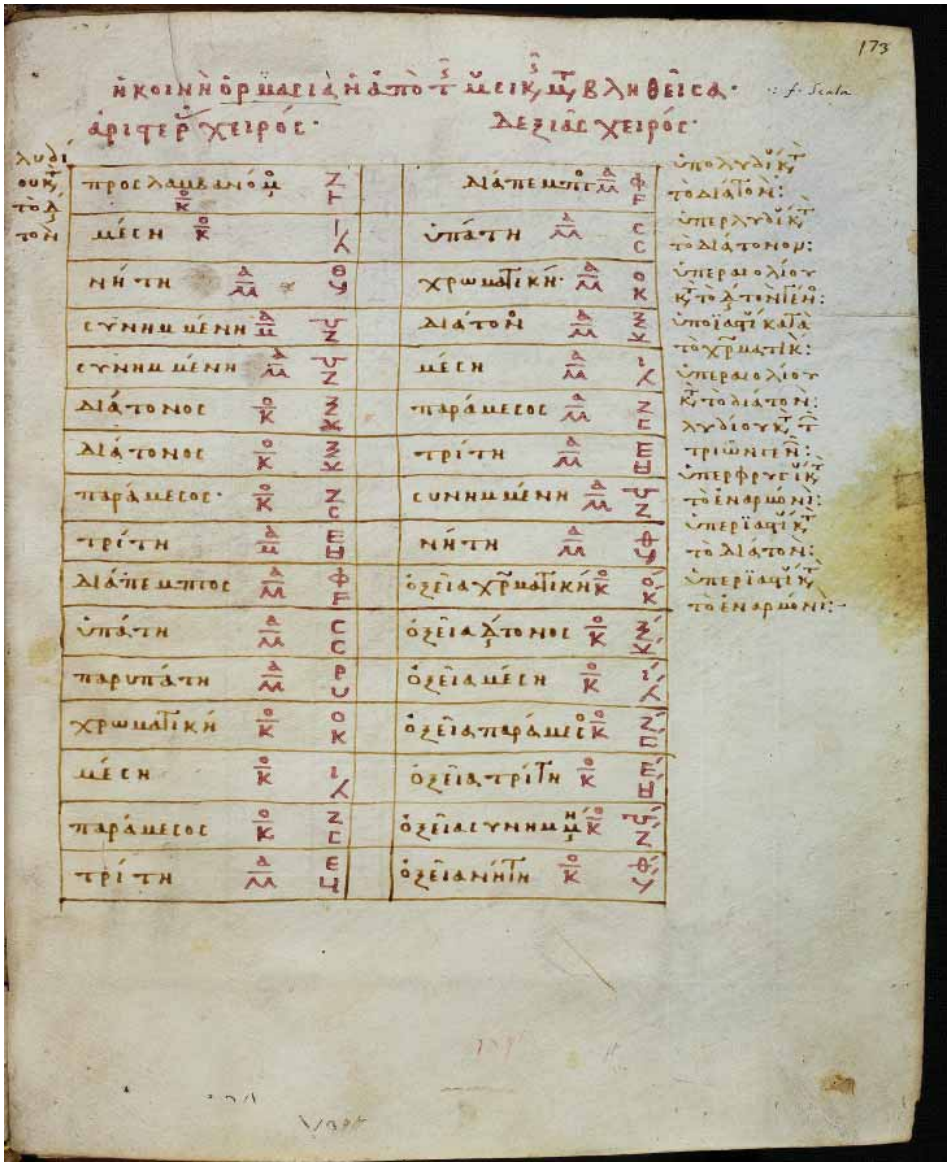


Figure 2. Codex Pal. Graec. 281. page 173 Obv.

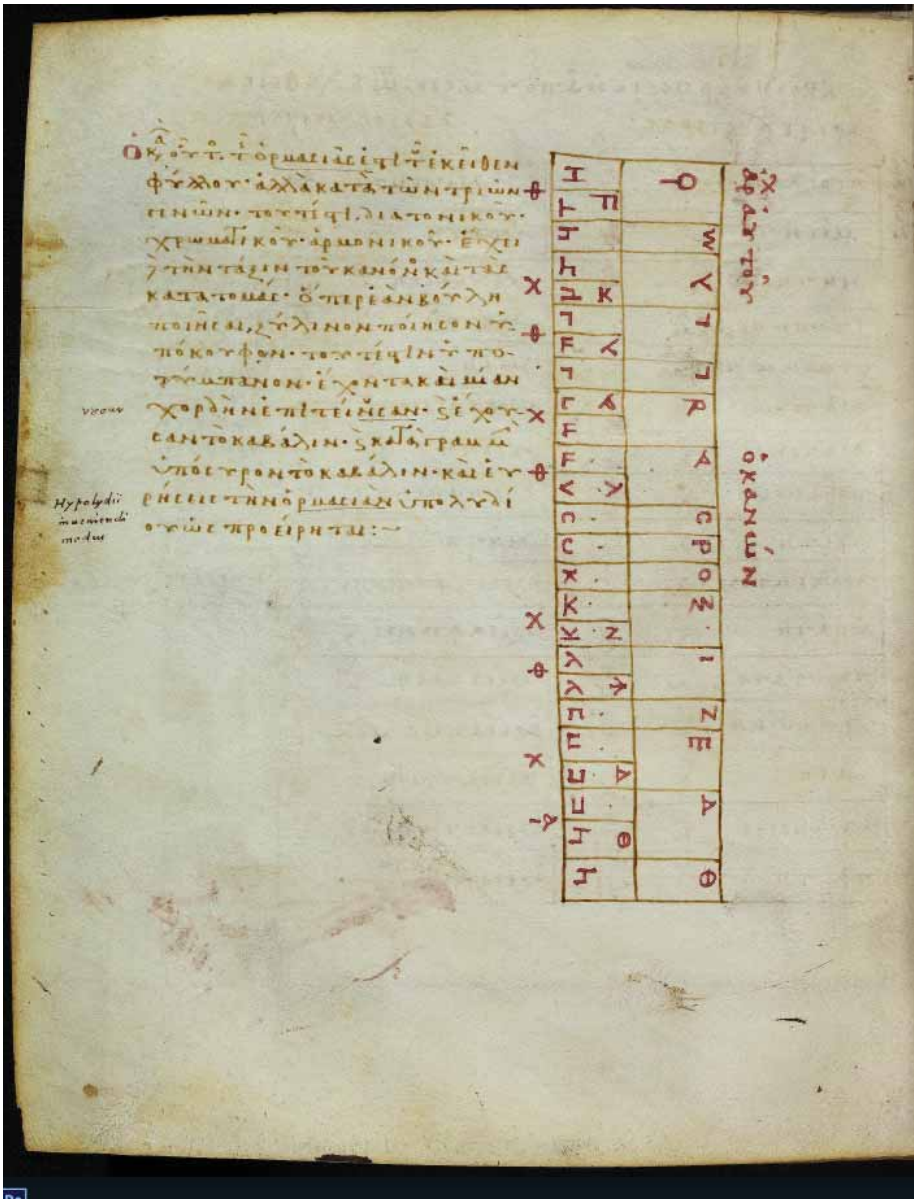


Figure 3. Codex Pal. Graec. 281. page 173 rev.

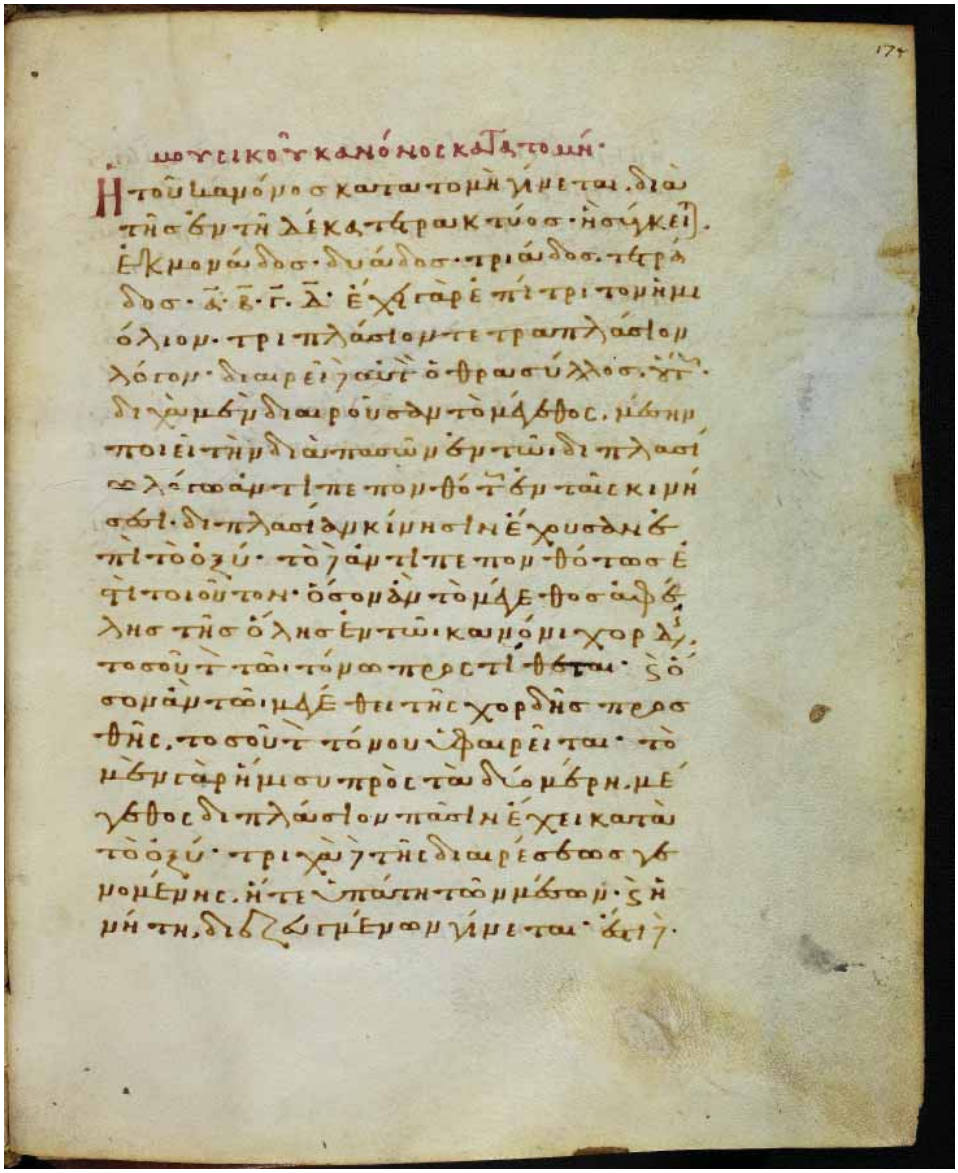


Figure 4. Codex Pal. Graec. 281. page 174 Obv.

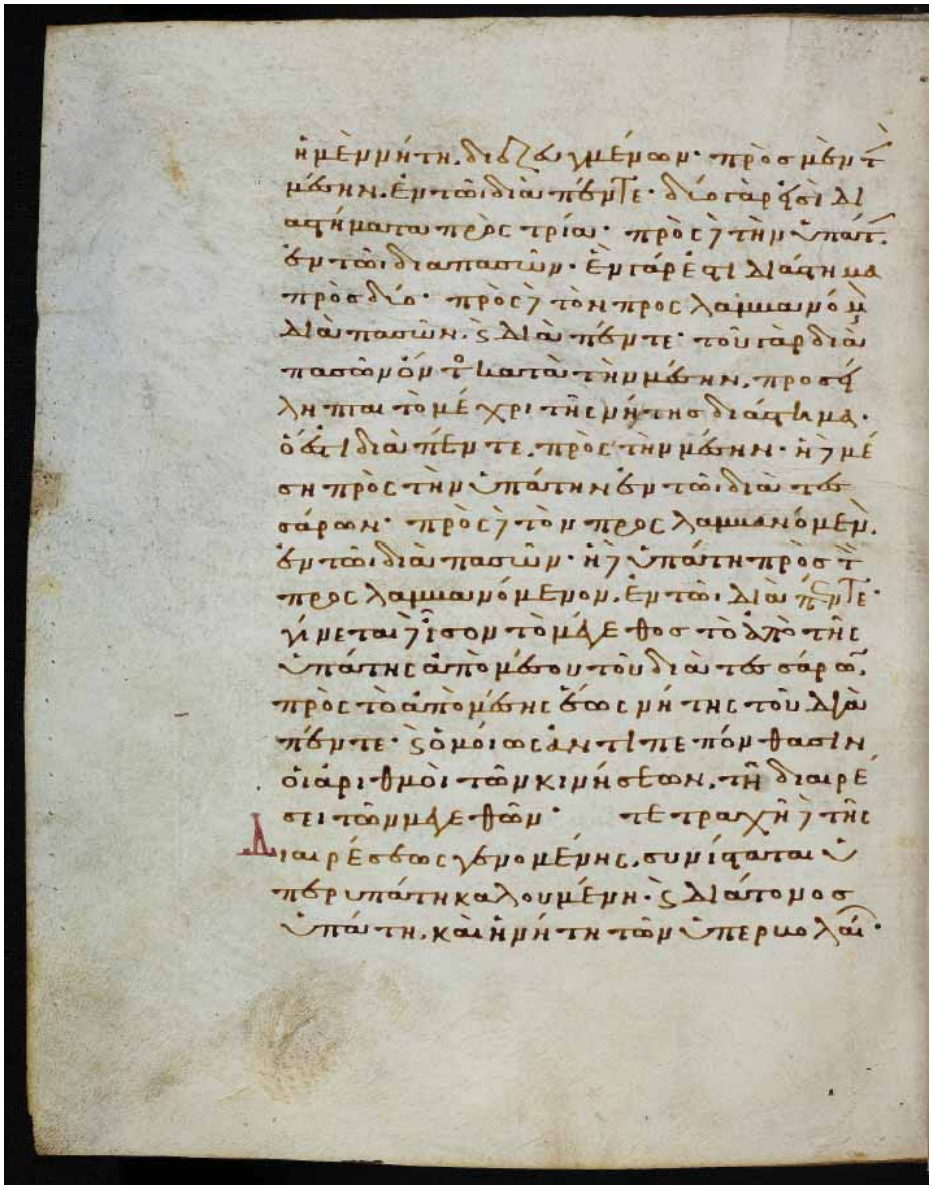


Figure 5. Codex Pal. Graec. 281. page 174 Rev.

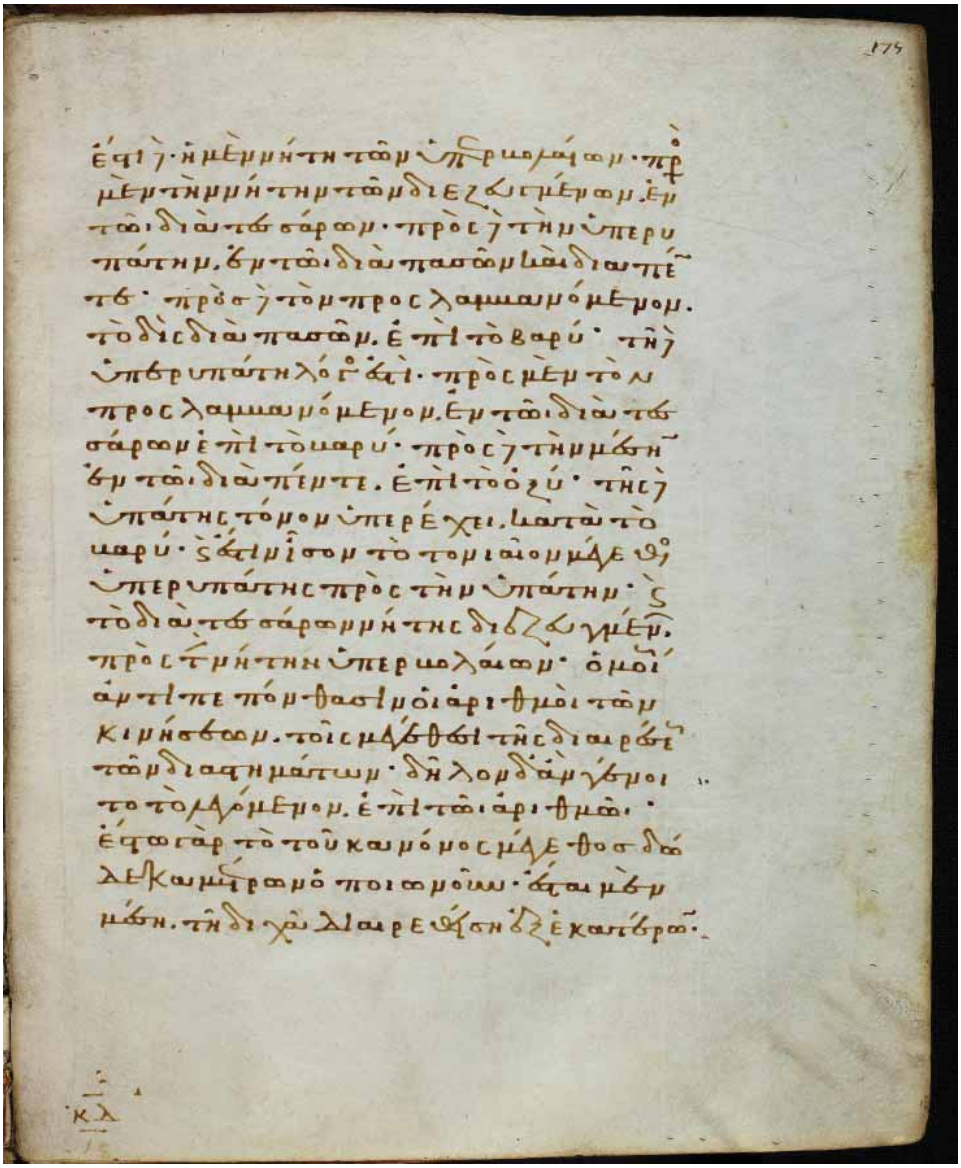


Figure 6. Codex Pal. Graec. 281. page 174 Obv.

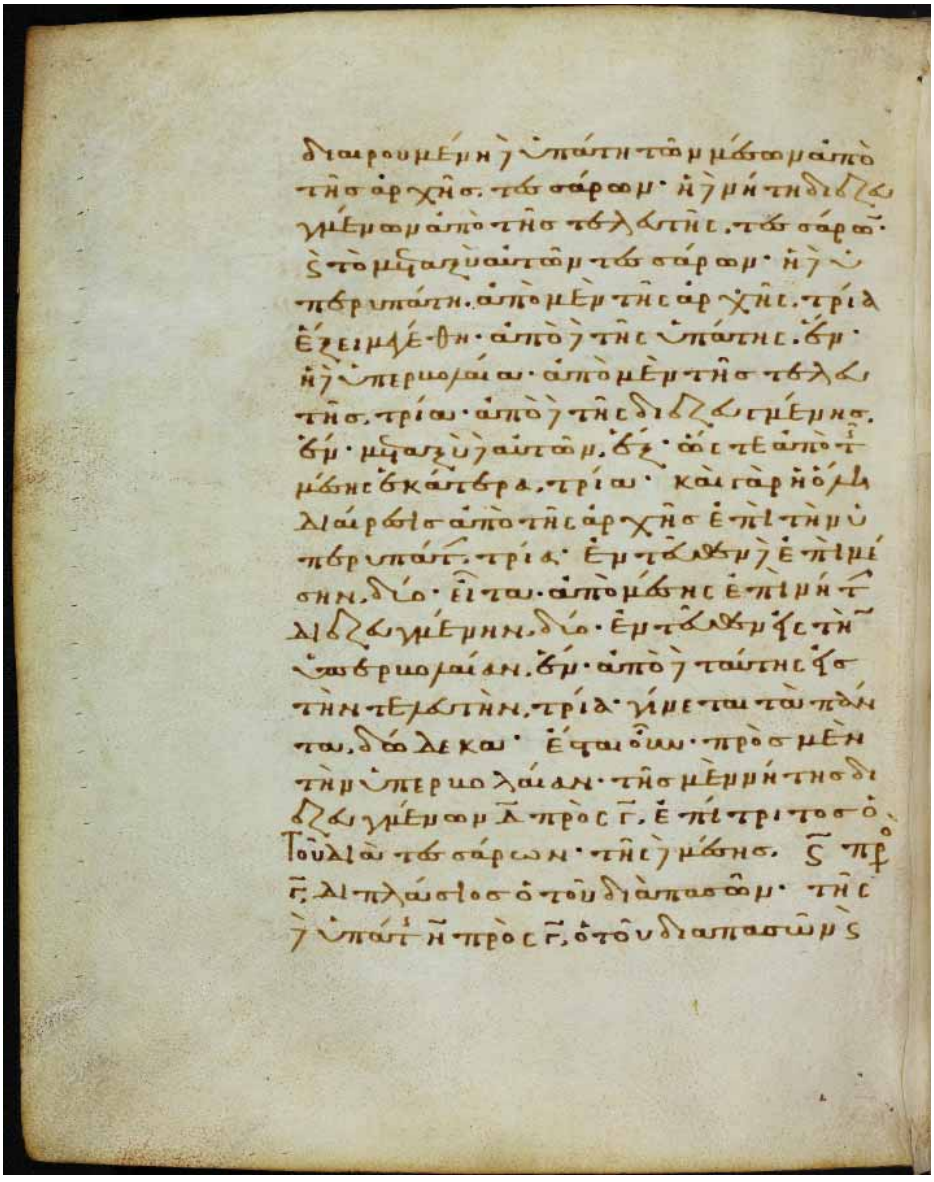


Figure 7. Codex Pal. Graec. 281. page 175 Rev.

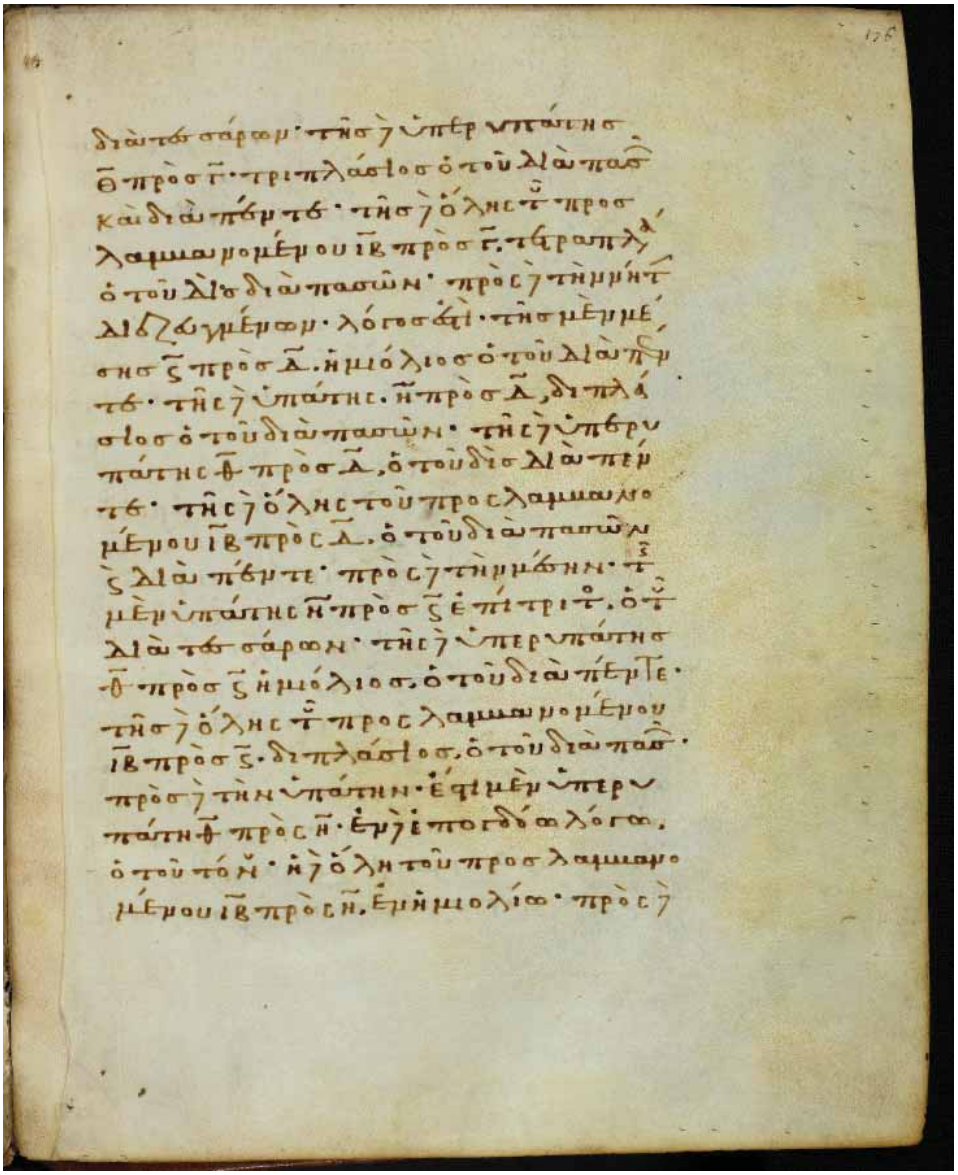


Figure 8. Codex Pal. Graec. 281. page 176 Obv.

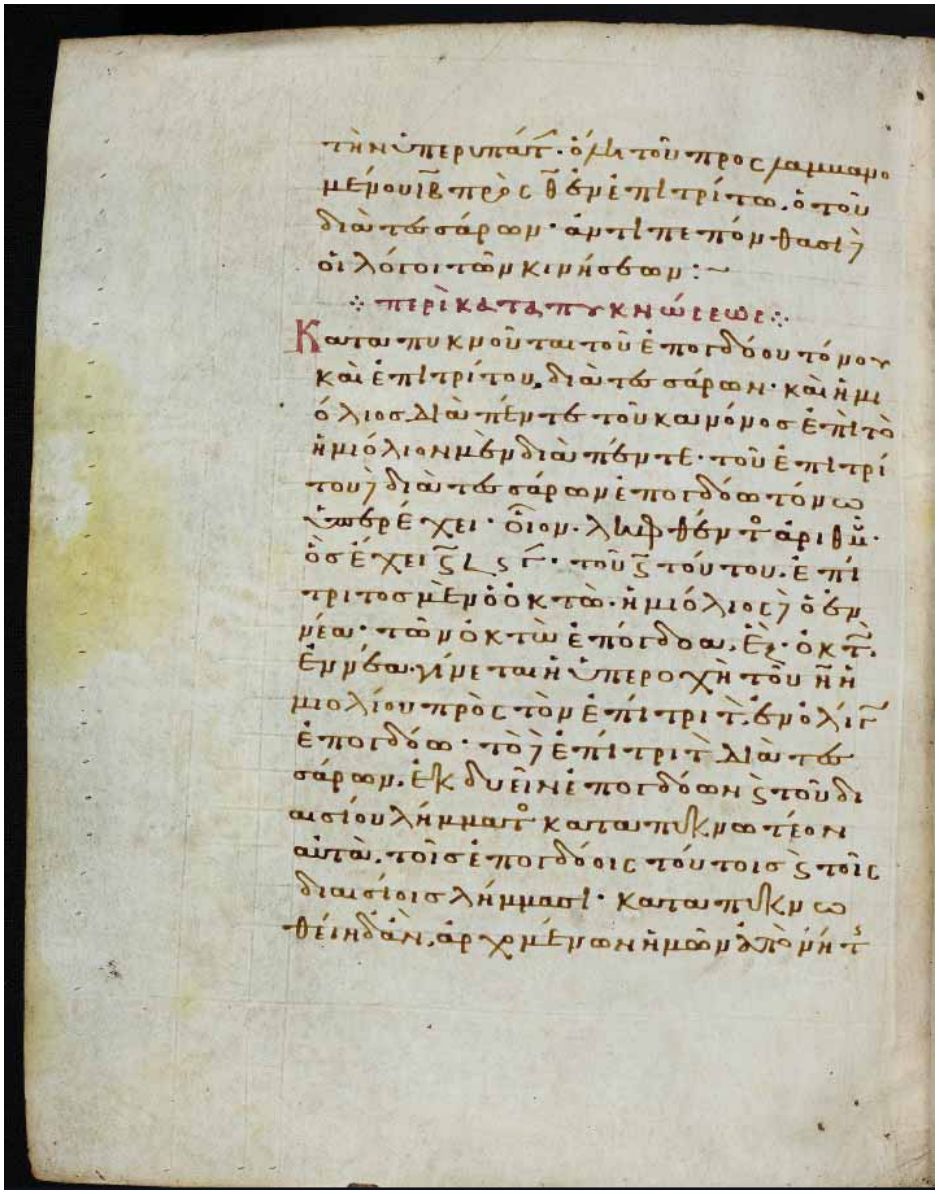


Figure 9. Codex Pal. Græc. 281. page 176 Rev.

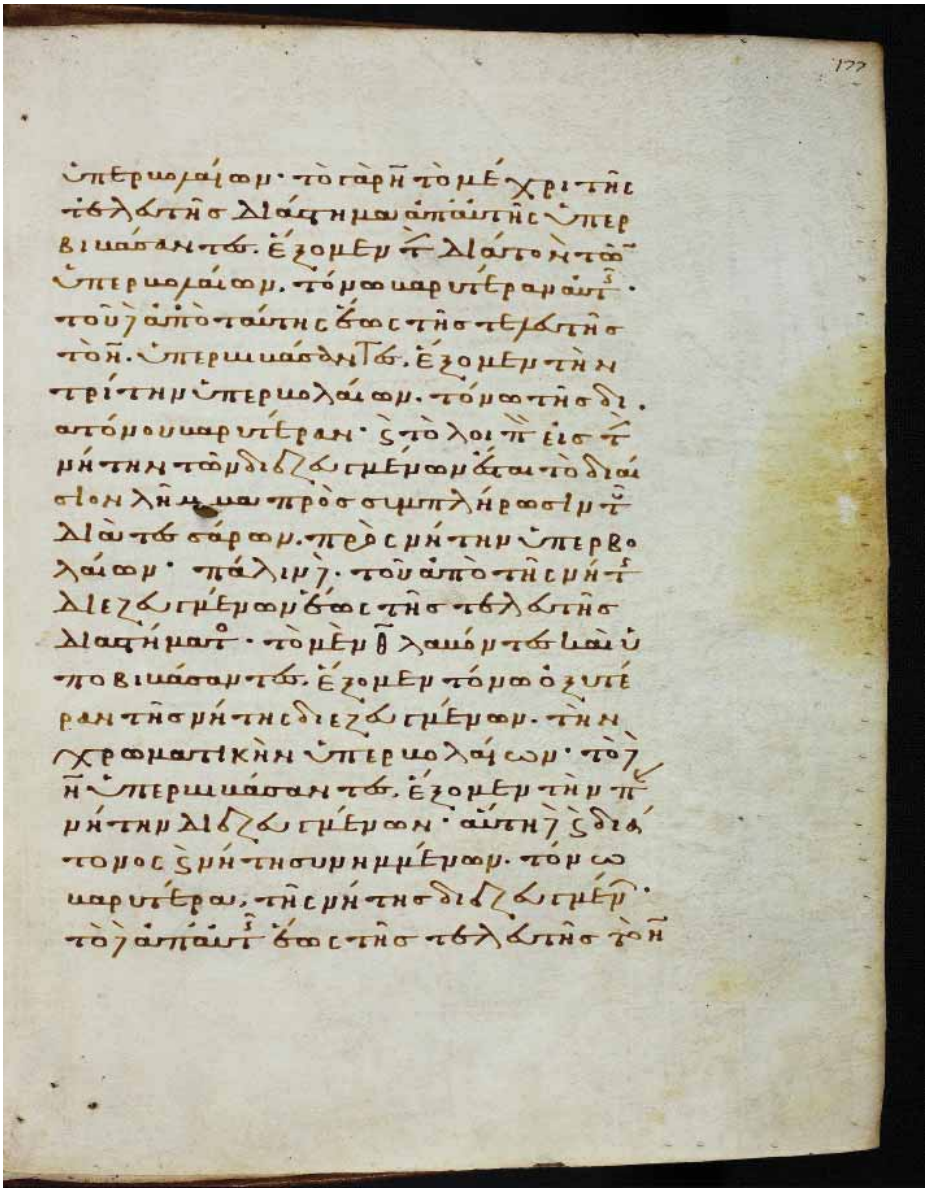


Figure 10. Codex Pal. Graec. 281. page 177 Obv.

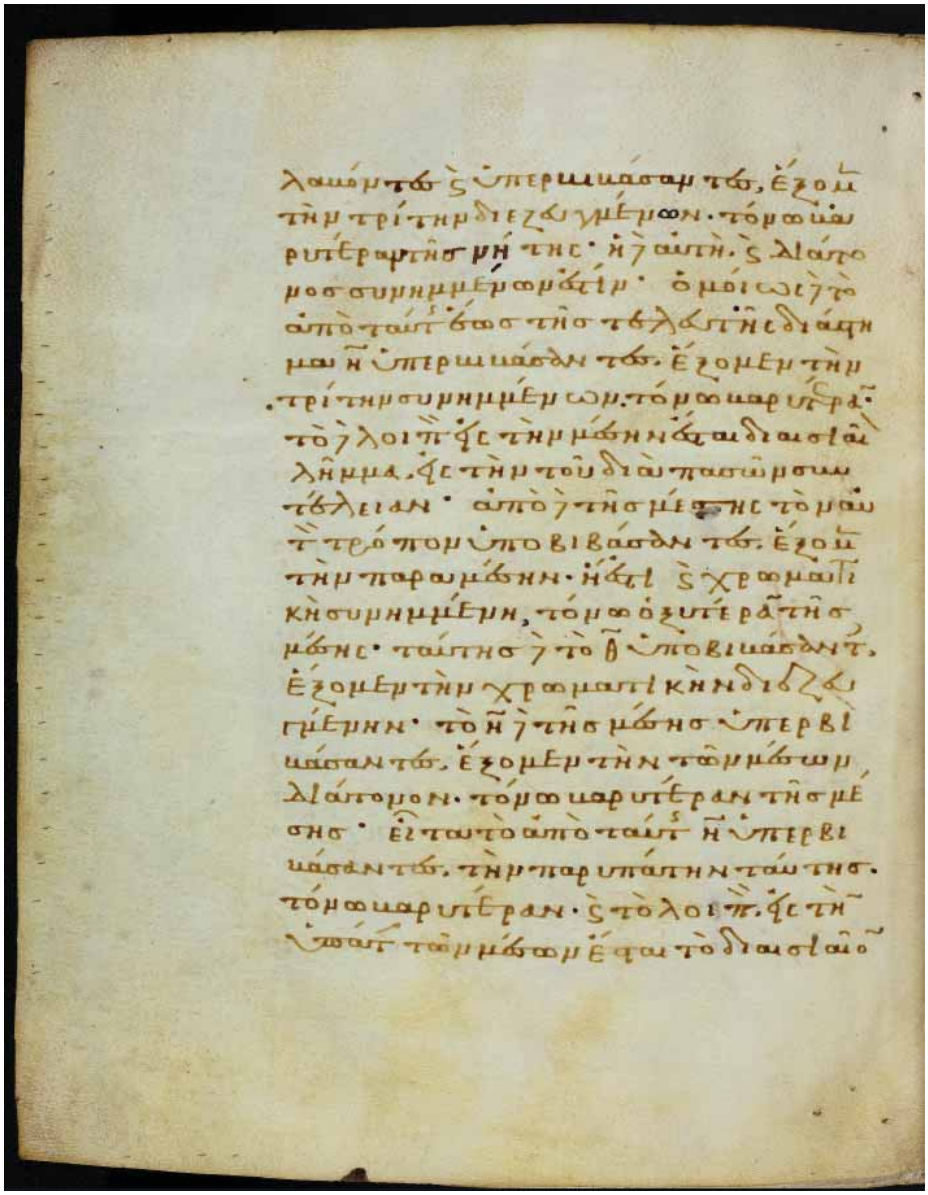


Figure 11. Codex Pal. Graec. 281. page 177 Rev.

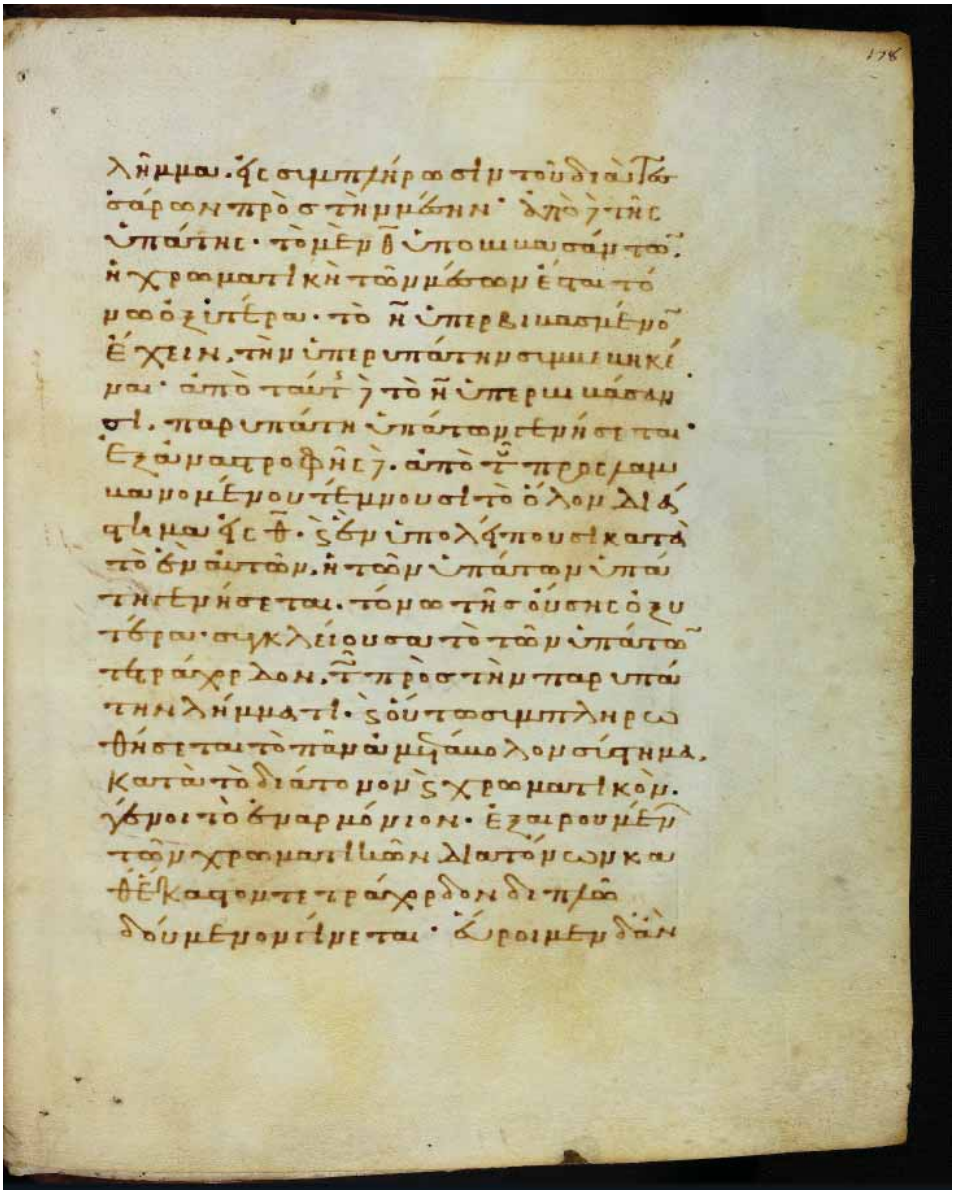


Figure 12. Codex Pal. Graec. 281. page 178 Obv.

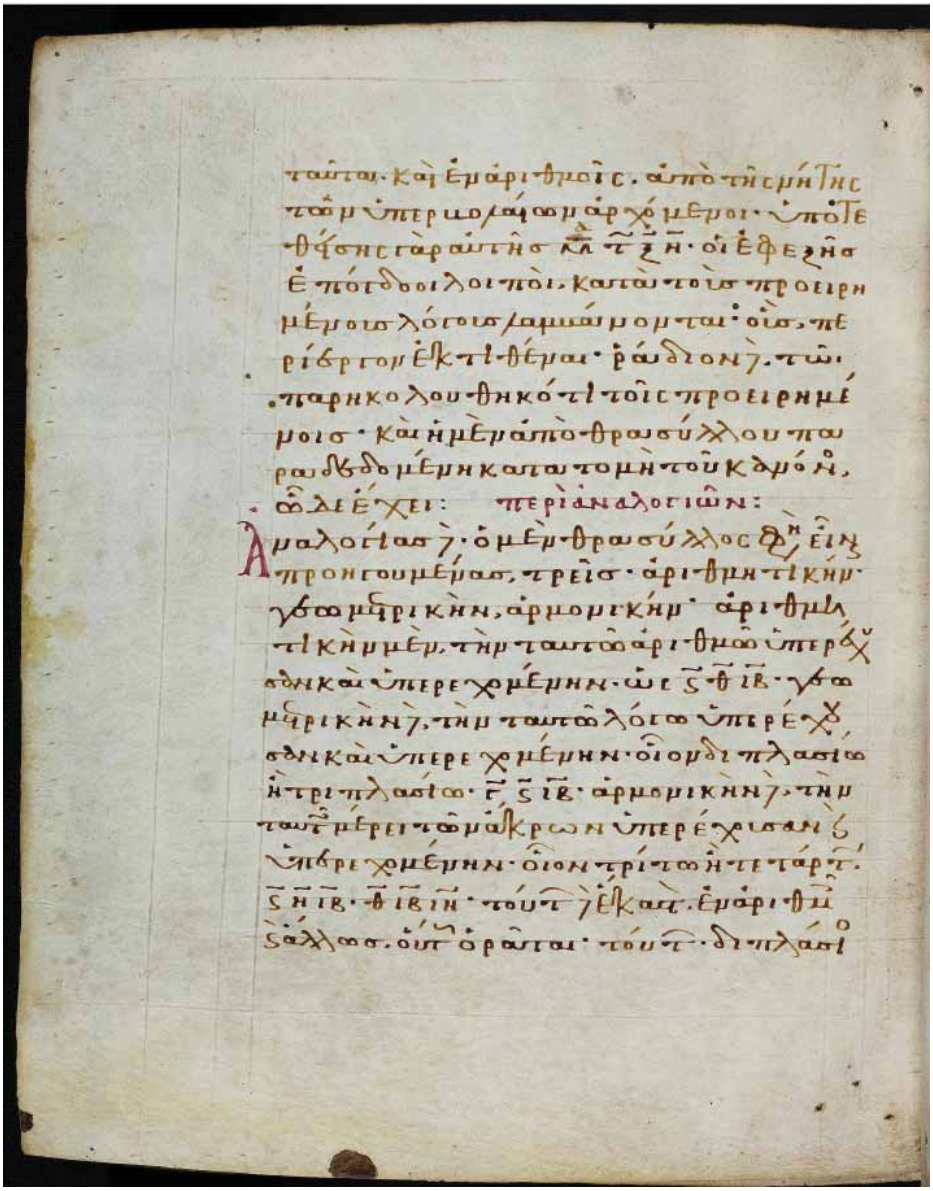


Figure 13. Codex Pal. Graec. 281. page 178 Rev.

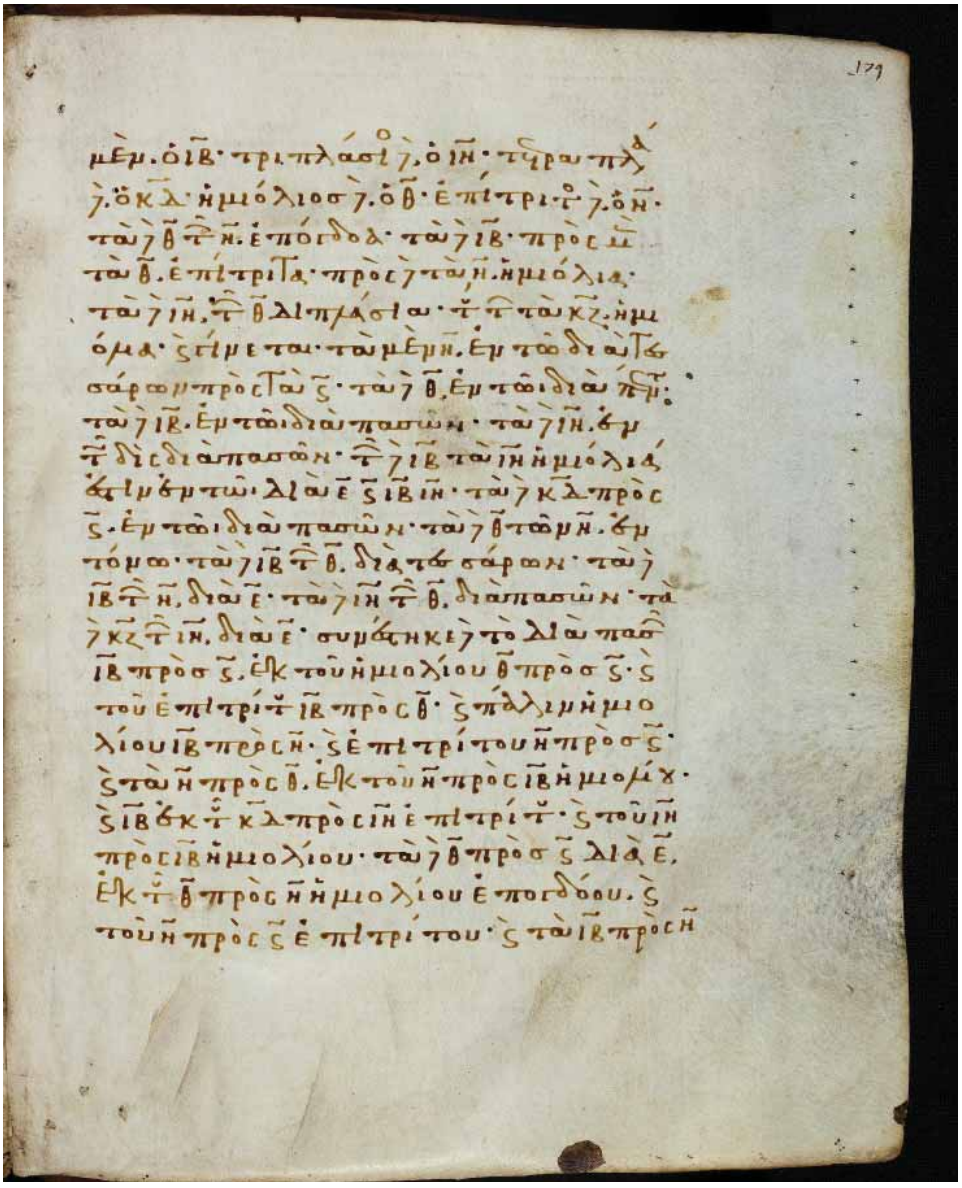


Figure 14. Codex Pal. Graec. 281. page 179 Obv.

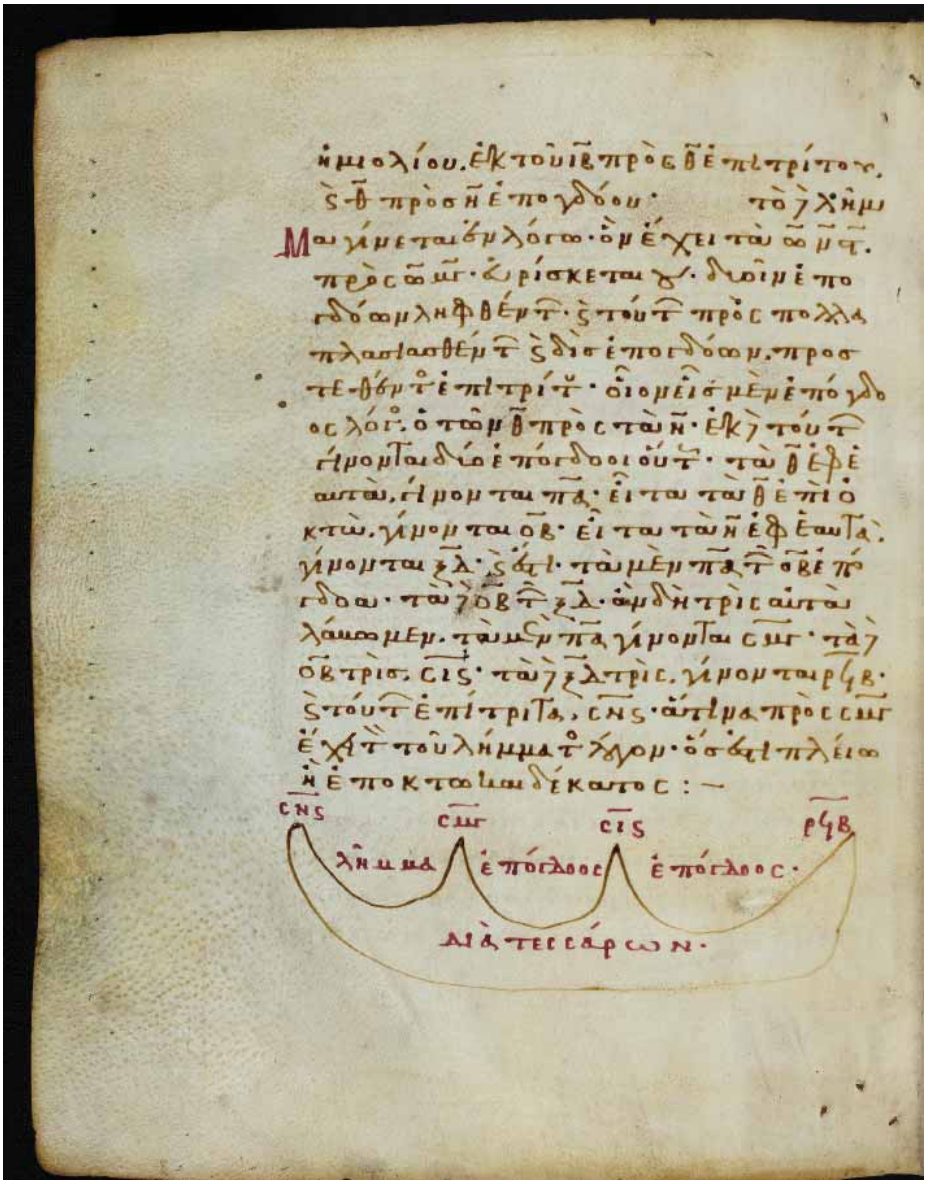


Figure 15. Codex Pal. Graec. 281. page 179 Rev.

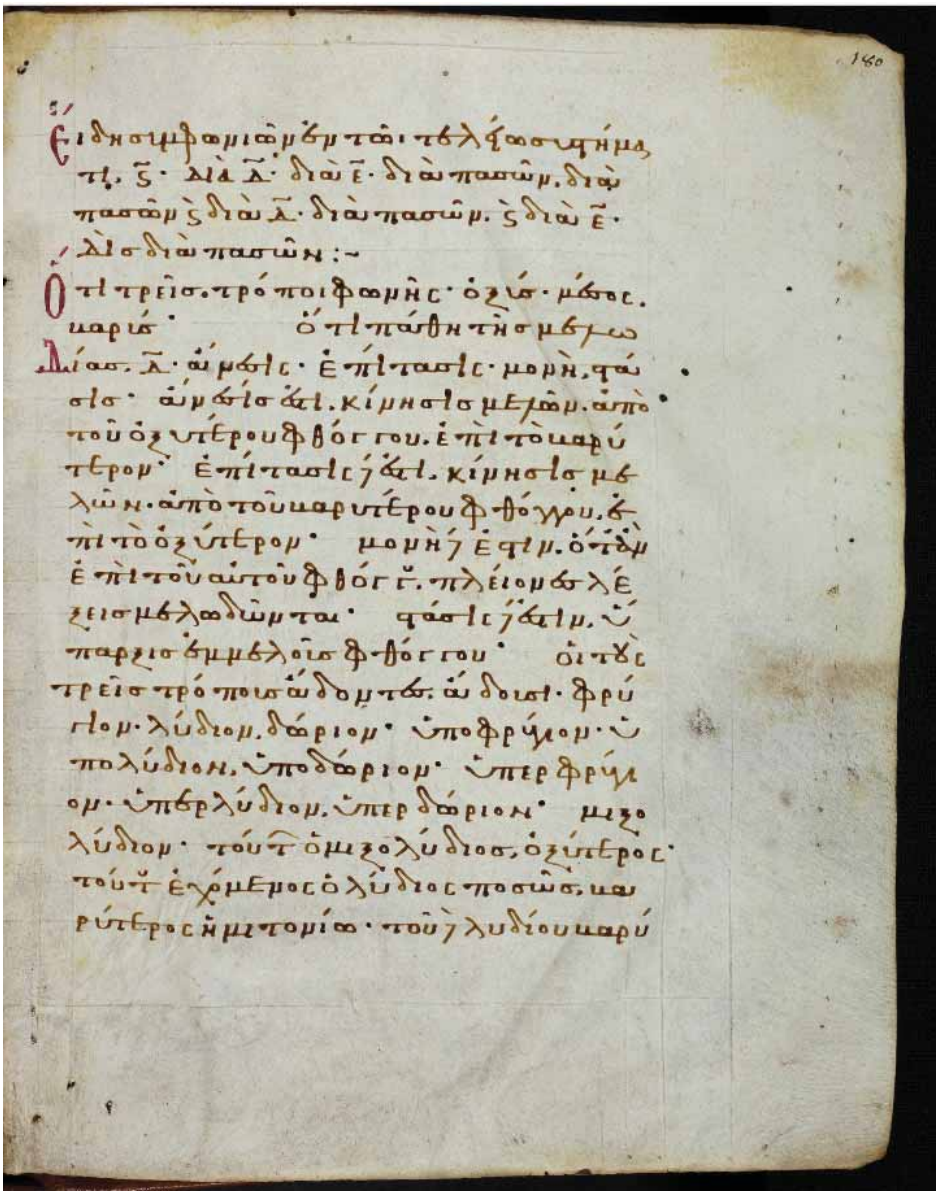


Figure 16. Codex Pal. Graec. 281. page 180 Obv.

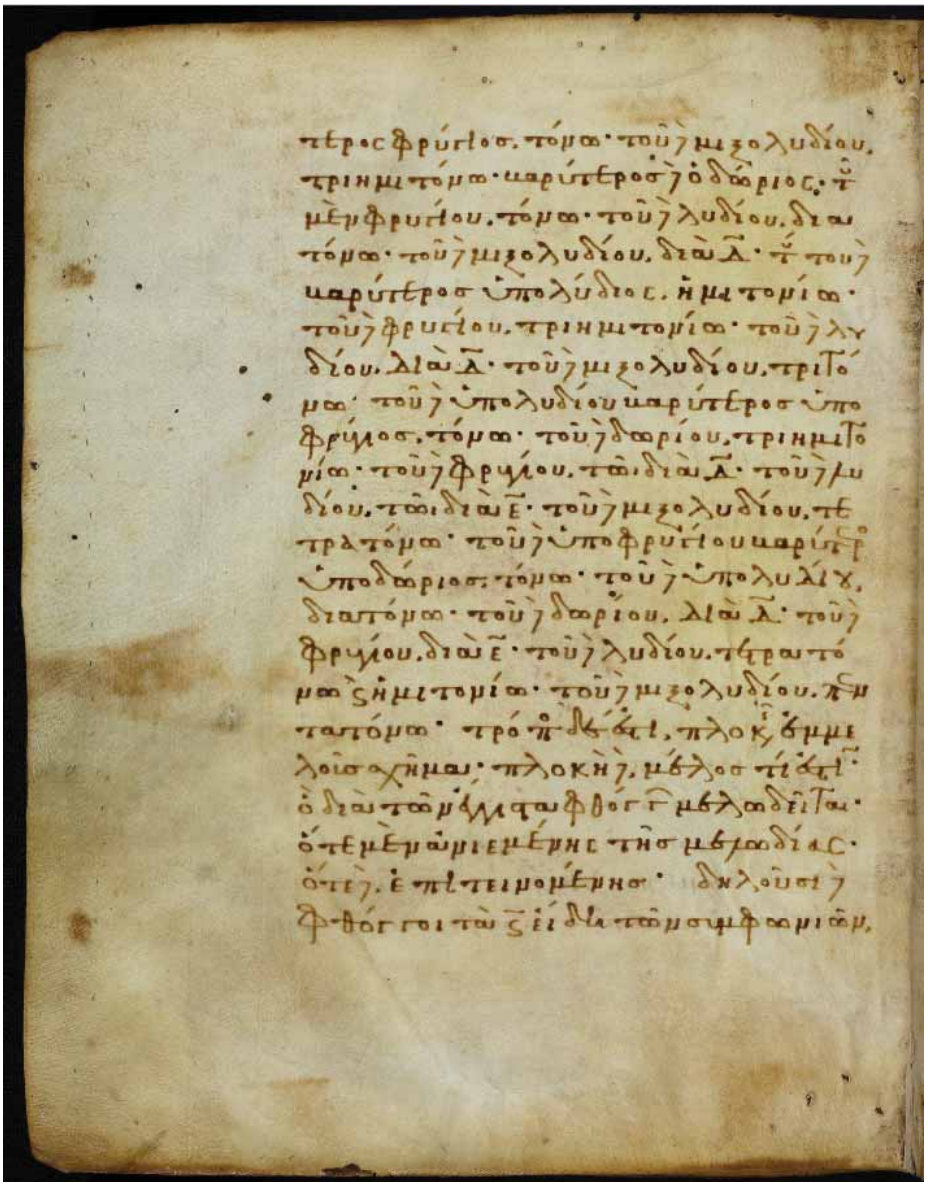


Figure 17. Codex Pal. Graec. 281. page 180 Rev.

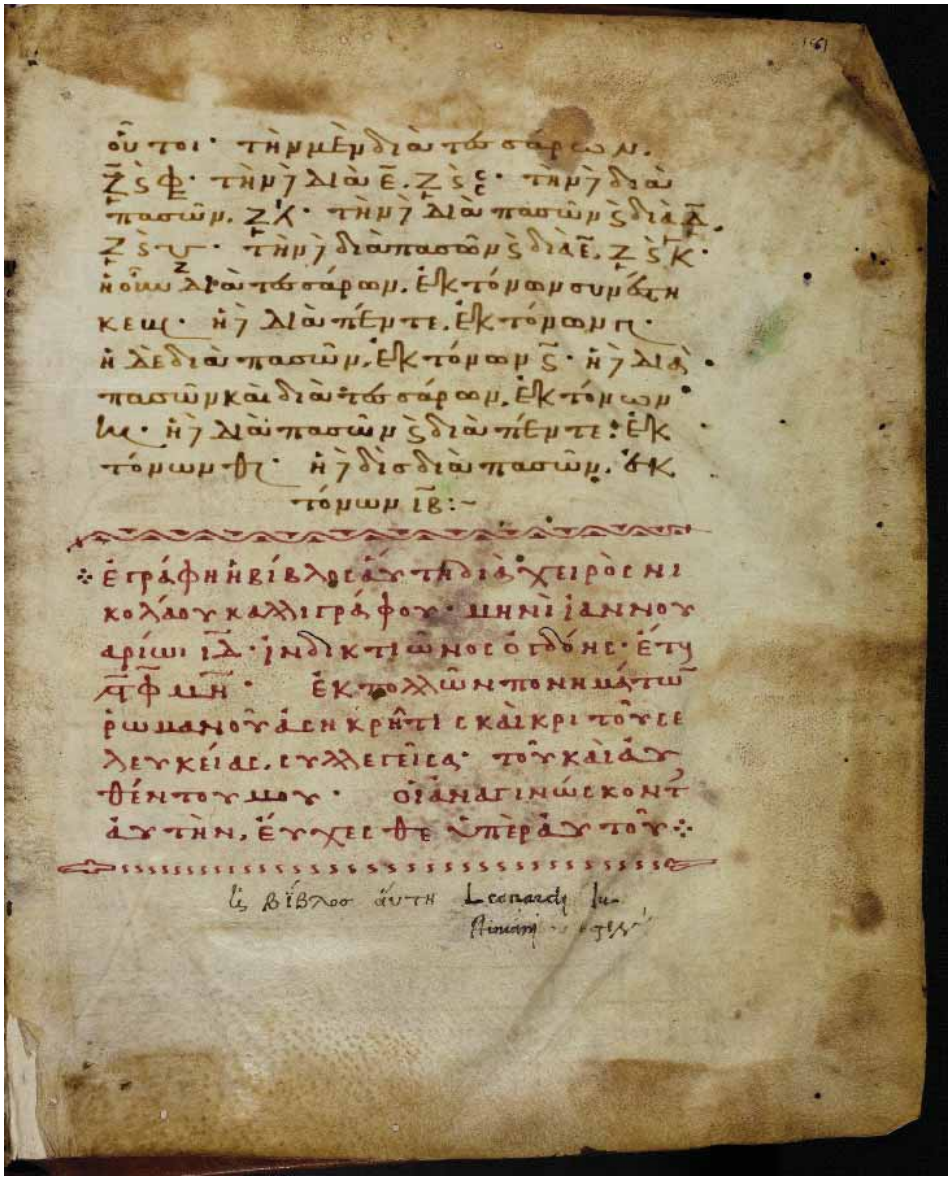


Figure 18. Codex Pal. Graec. 281. page 181 Obv.

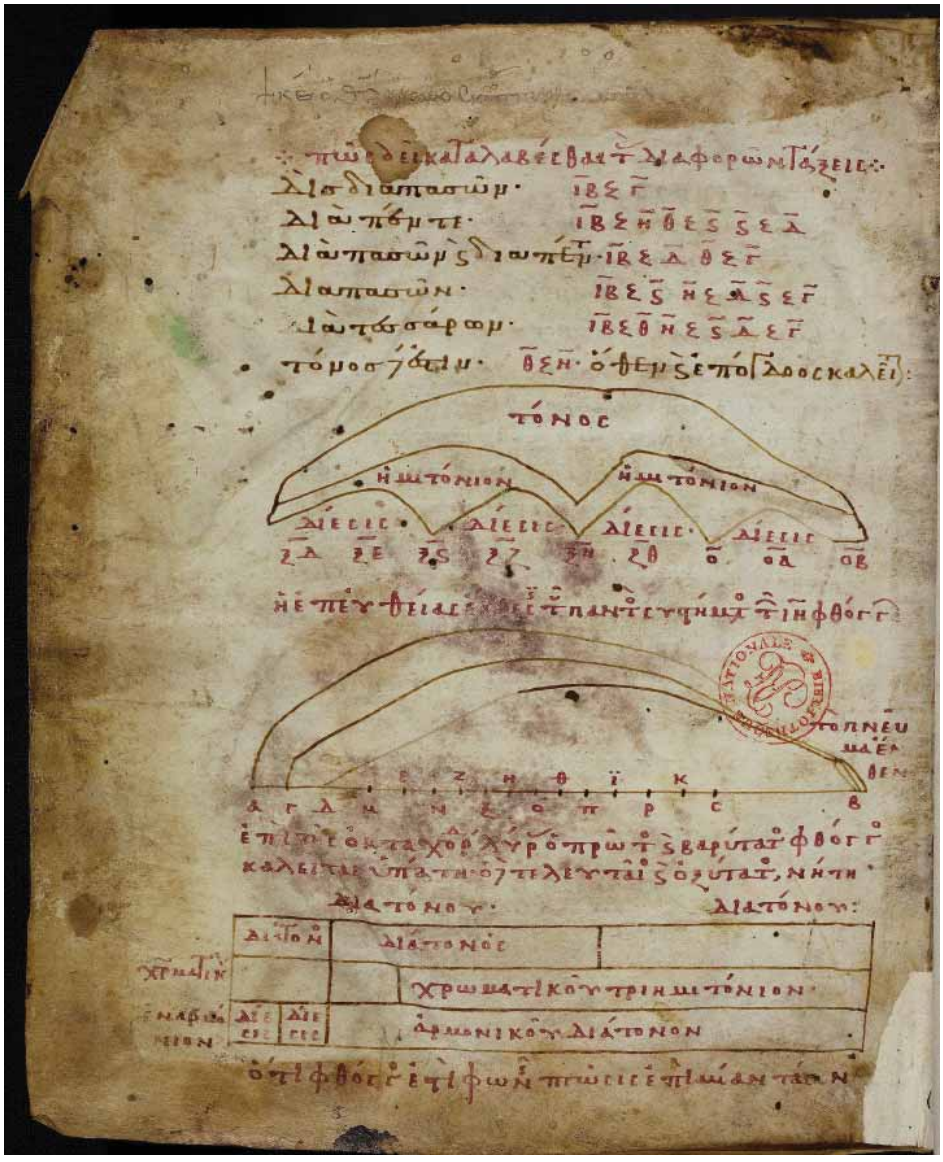


Figure 19. Codex Pal. Graec. 281. page 181 Rev.